Claims

What is claimed is:

5 1. A method of generating a permuted data sequence based on an input data sequence, comprising:

   receiving the input data sequence;

   partitioning the input data sequence into a plurality of sections;

   providing each section of the plurality of sections to a different

10 interleaver of a plurality of interleavers, wherein at least two of the plurality of interleavers are of a different type and wherein each interleaver of the plurality of interleavers generates an output based on the section provided to the interleaver; and

   combining the outputs from the plurality of interleavers to generate

15 the permuted data sequence.

2. The method of claim 1, wherein the plurality of interleavers includes at least two of the following: an S-random interleaver, an algebraic interleaver, a convolutional interleaver, a helical interleaver, a pseudo

20 random interleaver, a block interleaver, and a matched interleaver.

3. The method of claim 1, wherein combining the outputs from the plurality of interleavers includes:

   providing the outputs from the plurality of interleavers to

25 combinational logic that combines the outputs in a specific manner to generate the permuted data sequence.

4. The method of claim 3, wherein the specific manner includes appending the output from a first interleaver of the plurality of interleavers

to the end of the output from a second interleaver of the plurality of interleavers.

5.   The method of claim 3, wherein the specific manner includes using a combinational interleaver to interleave the output from a first interleaver of the plurality of interleavers with the output from a second interleaver of the plurality of interleavers.

6.   The method of claim 3, wherein the specific manner includes interspersing bits of an output from a first interleaver of the plurality of interleavers with bits of the output from a second interleaver of the plurality of interleavers.

7.   The method of claim 6, wherein the bits of the outputs from the first interleaver and the second interleaver are interspersed using a frequency of insertion calculated based on the following equation:

$$Frequency\_insert = floor(length(x_1')/length(x_2')$$

Where x_1' is the output from the first interleaver and x_2' is the output from the second interleaver.

8.   The method of claim 1, wherein the method is implemented in hardware of one of a wireless telephone and a portable computing device.

9.   The method of claim 1, further comprising:
       selecting the plurality of interleavers from a pool of interleavers based on a selection criteria.

10.   An apparatus for generating a permuted data sequence based on an input data sequence, comprising:

a buffer;

a pool of interleavers coupled to the buffer;

and combinational logic coupled to the pool of interleavers, wherein the buffer receives the input data sequence, partitions the input data sequence into a plurality of sections, and provides each section of the plurality of sections to a different interleaver of a plurality of interleavers in the pool of interleavers, wherein at least two of the plurality of interleavers are of a different type, wherein each interleaver of the plurality of interleavers generates an output based on the section provided to the interleaver, and wherein the outputs from the plurality of interleavers are combined by the combinational logic to generate the permuted data sequence.

11.   The apparatus of claim 10, wherein the plurality of interleavers includes at least two of the following: an S-random interleaver, an algebraic interleaver, a convolutional interleaver, a helical interleaver, a pseudo random interleaver, a block interleaver, and a matched interleaver.

12.   The apparatus of claim 10, wherein the combinational logic combines the outputs by appending the output from a first interleaver of the plurality of interleavers to the end of the output from a second interleaver of the plurality of interleavers.

13.   The apparatus of claim 10, wherein the combinational logic combines the outputs by using a combinational interleaver to interleave the output from a first interleaver of the plurality of interleavers with the output from a second interleaver of the plurality of interleavers.

14.   The apparatus of claim 10, wherein the combinational logic combines the outputs by interspersing bits of an output from a first interleaver of the plurality of interleavers with bits of the output from a second interleaver of the plurality of interleavers.

15.   The apparatus of claim 14, wherein the bits of the outputs from the first interleaver and the second interleaver are interspersed using a frequency of insertion calculated based on the following equation:

$$Frequency\_insert = floor(length(x_1')/length(x_2')$$

wherein x_1' is the output from the first interleaver and x_2' is the output from the second interleaver.

16.   The apparatus of claim 10, wherein the apparatus is part of one of a wireless telephone and a portable computing device.

17.   The apparatus of claim 10, further comprising:
    a switching mechanism for selecting the plurality of interleavers from the pool of interleavers based on a selection criteria.

18.   A method of generating a permuted data sequence based on an input data sequence, comprising:
    receiving the input data sequence;
    determining a subset of interleavers, from a plurality of interleavers, to be used in generating the permuted data sequence;
    providing the input data sequence to the subset of interleavers, wherein the interleavers produce modified output data sequences based on the input data sequence; and

combining the modified output data sequences to generate the permuted data sequence.

19.   The method of claim 18, wherein determining the subset of interleavers includes determining the subset of interleavers based on header information received with the data sequence.

20.   The method of claim 18, wherein determining the subset of interleavers includes determining the subset of interleavers based on a mapping table that maps types of data sequences or sources of data sequences to a subset of interleavers.

21.   The method of claim 18, wherein the subset of interleavers includes at least two interleavers that are of a different type from one another.